OF CONGRESS
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THE AMERICAN

GAS LIGHT JOURNAL

REDMAN & KENNY, N.Y.

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, VENTILATION, WATER SUPPLY AND DISTRIBUTION, & GENERAL SCIENCE.

VOLUME XLIV.—No. 3.
Whole No. 639.

NEW YORK, TUESDAY, FEBRUARY 2, 1886.

$3 PER ANNUM
IN ADVANCE.

M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager.
JOS. R. THOMAS, C.E., Editor.

Published on the 2d and 16th of each month, at No. 42 Pine Street, N. Y.

Terms of Subscription, Including Postage.—For the United States and Canada, $3 per annum. European countries, $3.50 (15 shillings—18 francs). All payments to be made in advance. Single copies, 15 cents.

Remittances should be made either by post-office order, registered letter, or bank draft on New York, payable to the order of A. M. Callender & Co.

Collections are invariably made directly from this office, for subscriptions, advertisements, etc. We have agents to solicit the same, but they are not authorized to receipt for money.

The American News Company, Nos. 39 and 41 Chambers street, New York, are agents for this JOURNAL. Newsdealers will send orders to them.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

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[OFFICIAL NOTICE.]

New England Association of Gas Engineers.

OFFICE OF THE SECRETARY OF THE
NEW ENGLAND ASSOCIATION OF GAS ENGINEERS,
BIRMINGHAM, CONN., Jan. 29, 1886.

The Sixteenth Annual Meeting of the New England Association of Gas Engineers will be held at Providence, R. I., on Wednesday and Thursday, Feb. 17th and 18th, 1886.

The headquarters of the Association will be at the Narragansett House, and the meetings will be held in one of its parlors.

It can now be announced definitely that the following papers will be read:

A paper (subject not yet received) by Mr. C. J. R. Humphreys, of Lawrence, Mass.

"Fuel Gas," by Mr. C. F. Prichard, of Lynn, Mass.

"Statistics on Water Gas," by Mr. J. H. Rollins, of Worcester, Mass.

"Notes on Construction of Gasholder Tank," by Mr. A. B. Slater, of Providence, R. I.

"Construction and Cost of a Gasholder and Tank," by Col. W. A. Stedman, of Newport, R. I.

"Results in the Use of a Hydraulic Main," by Mr. S. G. Stiness, of Pawtucket, R. I.

From the well-known ability of the gentlemen above named it will be seen that the literary part of our programme is amply provided for; and, as this constitutes the most important part, the success of the meeting is now assured. The programme, so far as it has been decided at date of writing, is as follows:

Meetings will be held from 10 A.M. to 1 P.M., and from 3 P.M. to 7 P.M., on Wednesday; and from 10 A.M. to 1 P.M. on Thursday. On Wednesday evening there will be a banquet in the dining room of the hotel. Thursday afternoon a visit will be made to the two stations of the Providence Gas Light Company, returning in time to catch the evening trains, in all directions, out of Providence.

It is earnestly hoped that all members will be present at the coming meetings; and, as the subjects of most of the papers are now announced, that they will come prepared to take part in the discussions that will naturally follow the reading.

Those wishing rooms reserved will please notify Mr. L. H. Humphreys, proprietor of Narragansett Hotel, Providence, R. I., at once.

A meeting of the directors of the Association will be held, at 8 P.M., Tuesday, Feb. 16th. Members intending to present papers before the Association will please have them in the Secretary's hands before the hour of the meeting of the directors, so that they may be accepted by the Board of Directors, as required by the Constitution.

Parties wishing to join the Association will please notify the Secretary at once.

CHAS. H. NETTLETON, Sec'y.

GEN. ROOME RETIRES FROM THE PRESIDENCY OF THE CONSOLIDATED COMPANY.

In our "item" columns of current issue will be found the names of the gentlemen chosen by the stockholders of the Consolidated Gas Light Company to direct the operations of that vast industrial corporation during the present year. In comparing the list with that of year previous it will be

noted a slight change has occurred in the *personnel* of the Board of Direction, in that Messrs. John P. Kennedy and Arthur Leary retire therefrom, their places being taken by Messrs. Elias S. Higgins and Henry Clausen. These changes have no special significance, and no one who has paid attention to the attitude maintained by the Mutual Company towards the Consolidated Company will seek further explanation as to why the substitution was made.

At the subsequent meeting of directors to perfect executive organization for 1886 some radical changes occurred, the list of officers being as follows:

President—Mr. Jas. W. Smith.
First Vice-President—Mr. Thos. K. Lees.
Second Vice-President—Mr. Oscar Zollikoffer.
Treasurer—Mr. Harrison E. Gawtry.
Secretary—Mr. Oscar F. Zollikoffer.

While the above list presents but one name (that of Mr. Oscar F. Zollikoffer) differing from the schedule presented in 1885, it will be at once perceived that the official rating (with the exception of Vice-Presidents) has been greatly changed. In effect the changes are all in the nature of honorable promotions; and with that simple statement any further mention of this portion of the case may be dismissed. It is not that, but this, with which we wish to deal: Gen. Charles Roome, for 45 years the central figure in American gas history, and also the most prominent gas engineer of his time, no longer appears as "the man at the helm." Despite the flight of years, and notwithstanding the rigors of his long and busy life, the General is to-day about as active and alert as was the case a score of years ago. His health is perfect, and his business perspicacity undimned and staunch; and while we honestly regret that he should and did see fit to decline (despite the arguments and efforts of his associates) a re-election to the Presidency of the Consolidated Company, we cannot but admire the undeniable cool and collected common sense that urged him on to say, "Gentlemen, I have labored long and faithfully in the service, and have fairly earned a respite from further arduous duty."

But if Gen. Roome no longer figures as the occupant of the President's chair, his deft and skillful hand will still be employed in guiding on the craft whose every timber was joined together under the supervision of his zealous care. Refusing to accept a severance of their relations, the executive resolved upon the creation of a Managing Committee, to be composed as follows: Chairman, Gen. Charles Roome, with Messrs. T. K. Lees, Oscar Zollikoffer, and H. E. Gawtry as his associates thereon. So that after all the General still remains "in harness." There is to-day probably not another "gas man" in the world with such a record as that possessed by the General. He entered the service of the Manhattan Gas Company in the year 1836; became its chief-engineer in 1841; and its President in 1855—acting as such until the merger agreement of 1884, when, on November 10th of that year, he assumed the Presidency of the Consolidated corporation. What a wealth of progress in our business is embraced between the years above noted; and of that progress how much may be traced to those who controlled the policy and practice of the Manhattan Company! The infant of '36 has developed into the giant of '86!

CLOSING REFERENCE TO THE HARTLEY FUND.

With this issue of the JOURNAL, as stated in our reference to the subject in the Jan. 2d number, we close up the matter of collecting American subscriptions to the fund for the benefit of the late Mr. F. W. Hartley's family. We must confess that our attempt has resulted in partial failure, since we did expect that a total amount of, perhaps, $1,000 would result from the appeals made through our columns. But, as our readers are the best judges as to whether or not aid should have been extended in the case under consideration, we, as a necessity, must accept their verdict. We desire to extend our thanks to those who have contributed, and submit that their action does prove the existence of a kinship in the business and science of gas engineering—be the members of that kinship located in New York or New Zealand. Additional subscribers to the fund are the following:

Albo-Carbon Light Company, Newark, N. J.	$25 00
Butterworth, W. C., Rockford, Ills.	10 00
Rockford Gas Company, Rockford, Ills.	25 00
W., New York city	2 00
Previously acknowledged	238 00
Total	$300 00

We are in receipt of a letter from Mr. W. H. Bennett (Secretary of the home fund) dated "London, Jan. 4th, 1886," in which the anticipations conveyed by our article of Dec. 16th are verified. He assures us that American subscribers will receive a statement as to final distribution of moneys received.

PUBLICATION DELAYED.—Communications from Fred. Egner, St. Louis, Mo.; H. E. Clark, Kansas City, Mo.; and facts in regard to "Maj." Merrill's operations, at Lawrence, Mass., go over to Feb. 16th issue.

[OFFICIAL REPORT—Continued from page 36.]

Thirteenth Annual Meeting of the American Gas Light Association.

HELD AT COLLEGE HALL, CINCINNATI, OHIO, OCT. 21, 22, 23.

SECOND DAY—AFTERNOON SESSION.—THURSDAY, OCT. 22.

In accordance with a motion offered by Capt. White, it was resolved that, owing to lack of time and the absence of the writers, the papers entitled, "Relations of Corporations to the Municipality," by Mr. J. B. Crockett, President of the San Francisco (Cal.) Gas Light Company; and "The Thermophote, or Self-Registering Photometer," by Dr. T. O'Conor Sloane, of New York city, be "taken as read;" also, that the same be printed in the AMERICAN GAS LIGHT JOURNAL, in the regular order of publication of proceedings. Mr. Crockett's paper is as follows:

RELATIONS OF CORPORATIONS TO THE MUNICIPALITY.

To the Members of the American Gas Light Association: Gentlemen—I herewith beg to submit for your consideration the following remarks relating to the above named subject. That the State has the power to regulate all corporations, deriving their existence from the organic law regulating the formation of corporations, is a fact which has never been successfully denied; but it is only within later years that any attempt has been made to regulate the operations of manufacturers, in the matter of saying what price shall be charged either for services performed or commodities furnished.

While corporations have at all times been subjected to such general laws as the State might enact, still there could be no general law passed (in regard to the fixing of any price for gas) which would be either justly or fairly applicable to all the companies operating gas plants in different sections of the State. This is obvious since, with variance in locality, the conditions of manufacture must radically differ, both in regard to amount of gas produced, and dissimilarity in cost of material.

In most of the States the Constitution requires that corporations must be organized under general laws; and this provision has been held to apply, not only to the laws of organization, but also to any subsequent amendment thereto. Many attempts have been made in different State Legislatures to avoid those provisions of the organic law (which require or direct that legislation must be general in its character, and which also forbid anything in the shape or guise of special legislation) by the passage of bills intended only to affect cities having a certain specified number of inhabitants—the legislators knowing full well that the measures could only apply to a certain city; but the courts have always held this to be special legislation—in fact the framers of the measure (so say the courts) might as well have specified the cities by name.

The Supreme Court of California, in the case of San Francisco *vs.* the Spring Valley Water Company (48 Cal. 513), speaking of formation of corporations under the general law, and not by a special act, held, "That, on the true construction of this constitutional provision, all private corporations must derive their powers from general laws, and not from special statutes.

"The general laws under which they were formed, and such others as shall afterwards be enacted, must alone define their rights and powers.

"On this theory all private corporations formed for similar purposes will stand upon the same footing, *enjoy the same rights, and be subject to the same burdens, which cannot be increased or diminished except by general law applicable to all.*"

The same attempt at special legislation, under the guise of a general law, was attempted by the Illinois Legislature, which passed a statute to apply to all counties having a population of 100,000, or more, inhabitants; but the Court said it "took judicial notice of the fact that the county of Cook is the only county in the State having a population of that number; and, that being the case, the county might as well have been called by name."

There are many other decisions of like tenor, all going to show that legislatures cannot by special legislation affect the corporate powers or rights of incorporated companies; but, again, it is generally conceded that by general laws they can delegate their powers to the local legislative bodies, or to a commission, for the purpose of regulating rates.

Such being the case, the question arises, Whether it is better for a gas corporation to deal directly with the municipal representatives, or with a commission appointed solely for the purpose of regulating the gas business, with a view to doing that which is just, as between the corporation and the consumer. First let us regard the *personnel* of the ordinary Board of Aldermen or Councilmen, or by whatever local name they may be termed.

In all large cities these men are not, as a rule, chosen because of their peculiar fitness for the position, either on account of their large business experience or great and statesmanlike qualities, but are usually men selected for their loyalty to party, who become sought after by people anxious to

carry through some scheme, or to get employment in some department of the city government. These men, so suddenly thrust into prominence, are usually of two classes:

First—Men with neither mental caliber nor business capacity, whose chief idea is to not only place themselves before the public, but also to derive more substantial benefits from continued attacks upon everything that comes before them.

The second class are the demagogues—men of ability, and considered honest, who, having once tasted the sweets of office, strive to get greater political preferment by continually abusing corporations. I consider these men of the second class to be the most dangerous sort we can possibly deal with. They call themselves honest; but are so morally dishonest as to prostitute their convictions in order to attain their personal ends; who pose before the public as men whom the dishonest corporations cannot buy; but who in reality are being continually purchased, by public opinion, to do what is contrary to their inmost convictions, as well as their ideas of justice.

To such men no facts can be shown, no arguments made, which will change their determination. Having once made up their minds that the public thinks the price too high, or the service bad, they forget all rights belonging to the corporation, seeming to remember only the fact that the public is the consumer of the product of the corporation whose prices they are to fix; and see in this the instrument for further advancement in the political field. Posing as friends of the people and enemies of corporations, these men are most dangerous; because, having brains and business ability, they are better able to understand the subject—in fact, were they not "slaves to ambition," they would be able legislators.

Again, these men are dangerous because, being men of ability, they (in a measure) rule and control the weaker ones associated with them. In view of these facts, it seems to me that gas companies cannot afford to submit their cases to a set of persons at once so unfair and so prejudiced. The question, then, arises, "If the State undertakes to regulate gas corporations, what is the least objectionable way in which it can be done?"

Is a gas commission—such as was lately appointed in Massachusetts—the most desirable and best way of arriving at such a conclusion?

A commission might, of course, contain the same objectionable features (so far as demagogues are concerned) as in the case of a board of aldermen; but are not the chances against it? The political bosses, as a rule, control cities rather than States; so that when an election for governor is about to occur they find that they not only cannot control a State organization, but, even if they could do so, in self defence they must nominate a man of respectability to head the ticket in order that the same may have character.

The appointment of a commission with tenure of office for two, four, or six years seems to me to be altogether the best way of regulating the differences which may (and do) arise between gas companies and the municipal government. Such term of office covers a sufficient period of time to enable them to get an insight into the numerous complications and dangers of the gas business—of which the ordinary legislator has no conception; neither has he the inclination to investigate, nor the capacity to understand.

In some respects the law recently proposed in the New York Senate seems to me to be better than the Massachusetts law, inasmuch as it gives the gas companies the right to select, or name, one member of the commission—thus giving them direct representation. The term of office being fixed for a given time also enables them to understand the intricacies of the business, and to act upon the facts brought to their notice, rather than upon the generally accepted theories of the public—that gas companies are but bands of robbers always ready to plunder the city.

Controllers of gas companies must no longer be oblivious to the fact that the public have become much better informed in regard to the manufacture of gas than heretofore—that the business is no longer one of mystery to the people at large.

Opposition companies, seeking franchises from municipal bodies, appear before them with specious promises of great reductions in price, better quality of gas, etc.; and the discussions which arise are printed in the daily papers, and thus are the people educated.

In my opinion, therefore, all companies will in the near future be liable to regulation; and if they are to be controlled, let them unitedly strive to have laws passed which will be just to the producer as well as to the consumer. The best way, in my judgment, would be for the American Association to appoint a committee of its ablest members to exchange views as to the best method to be adopted. Let them consult the ablest lawyers in regard to their rights; then let them draft a bill, subject to such modifications as the laws of the different States warrant, and let the gas companies seek to pass it in their legislatures by all honorable means.

I present this brief paper to the notice of the Association with the hope that the subject may be followed up by older and wiser members than myself, and that it may invite a discussion upon what I consider one of the most important subjects with which a gas company has to deal.

Dr. Sloane's paper on

THE THERMOPHOTE, OR SELF-REGISTERING PHOTOMETER,

is as follows:

Unceasing vigilance, the classic "price of liberty," may justly be declared the cost which the superintendent of a gas works has to incur for peace. But as no human being is fit for duty save for a portion of the day, some method of keeping watch over his works while he is absent or asleep is necessary for the gas engineer. In the past many devices have been brought forward and are now in use to effect this end. Self-registering pressure gauges are made to tell just what conditions of pressure prevail at different points of the works each instant of the 24 hours. One of the gauges keeps a check upon the engine driver, to see that he pulls hard enough, and not too hard, upon the hydraulic main. Another gauge, by the incidental changes of pressure, discloses the workings of the gasholders. A gauge connected with the main outside of the governor or reducing valve gives the street pressure at the works. To know how regularly gas has been made, hour by hour, the simple registering device, familiar to all, may be attached to the station meter.

Thus quantity of production and the pressure at all desired points may be registered accurately in the absence of the engineer; but hitherto the illuminating power has not proved amenable to such methods. Up to the present time, with the exception of the thermophote, no practical method of registering the quality of gas has been known. The thermophote fills up the gap. By it the illuminating power of gas is accurately registered, day and night for the 24 hours.

The writer has had the honor of presenting, in the past, several communications on this subject to the Society; and it is a subject of great gratification to him to be able to announce the practical realization of the prospects then disclosed. For the thermophote is now "on the market," to use an expressive, if inelegant, phrase. One of the instruments has been running, day and night, at the works of the Consolidated Gas Company, of New York city, for the last four months, with most satisfactory results. It has been described already in the American Gas Light Journal of July 16, 1885, and in other scientific journals. A few words as to its working is all that I care to give here.

A circular card is divided by radii into 24 equal sections (one for each hour), and concentric circles (one for each candle power). By the motion of the meter drum this card is rotated once every 24 hours behind a registering apparatus, actuated by a differential thermometer, so as to cause the position of a marker to vary with the illuminating power. Every fifteen minutes, or as often as desired, the marker is made to register the illuminating power. Thus the meter that regulates the supply of gas to the standard flame is so accurate in its delivery of gas that it is used as the time-keeper. This does away with the necessity of winding up a clock once a day. Every 24 hours the card is removed and a new one inserted. This takes about a minute. Once in two or three days a little water may be required to keep up the water level. This operation represents perhaps another minute. If in a dusty place, the bearings may need brushing off occasionally, which may represent another minute. This is all the attention it requires. If the water lever falls too low the flame is extinguished and the gas is automatically cut off. If the water level rises, the apparatus continues to work as usual. By the well-known water level overflow, in use on all station meters, the water may be kept at an exact level without any supervision. With this attachment the meter would run indefinitely without any attention whatever beyond replacement of the card.

It is hard to imagine anything, having analogous functions, that more completely takes care of itself. By substituting a long strip of paper, similar to the stock-broker's "tape," for the disk, the apparatus might run for weeks at a time in a locked room, registering the candle power during the whole period.

The first thing that would occur to many is that it is a complicated machine. It is in reality far from it. It is much simpler than a striking clock. Its paper disk is more easily replaced than is the paper sheet upon the cylinder of the usual type of pressure registering gauge. With regard to its accuracy, I long ago personally satisfied myself of this feature; and my views have been confirmed by the official reports of the Engineer and of the Chemist of the Consolidated Gas Light Company. My own original tests were made on coal gas. In New York it is running on water gas—a far more difficult gas to photometer, as it is perpetually varying in specific gravity and composition. My own convictions are that, as bar-photometering is frequently executed, the thermophote is more accurate. But the verdict of its success or failure must come from the engineers of the country.

The famous blunder of Dr. Letheby, noted in Bowditch's work on Gas Analysis, may be recalled to your memory. Dr. Letheby was one of the principal authorities on gas in England; yet he managed to photometer a gas as over seventeen candles that Dr. Hofmann afterward testified was of only fourteen and a fraction. Here was a case of doctors disagreeing to the

extent of three candles. The thermophote will never do this; and had it been extant in those days it is safe to say that the blunder, whoever made it, whether Dr. Letheby or Dr. Hofmann, would never have occurred.

Votes of thanks were, upon motion, extended to the writers of the papers above printed.

APPOINTING A COMMITTEE ON MEMORIALS.

Capt. White—Even though we are pressed for time at this session, it would ill-become us to overlook the sorrowful fact that we have had, during the past year, the great misfortune to lose from our ranks our Vice-President and fellow member—Mr. Thomas Butterworth, of Rockford, Ills. He was a man both near and dear to a great many members of this Association; and it would be highly improper did we adjourn without placing upon our record some suitable expression of the feeling entertained by this Society toward our deceased brother as a token, if nothing else, of our appreciation of the manly course of his life, and which would be in some manner indicative of the sorrow that we all so keenly feel. I know it is usual to commit such matters to the Secretary's care, and am certain that Mr. Humphreys would not seek to evade such task, mournful though it might be; but, on this occasion, I think some additional action should be taken by the Association, either through the appointment of a committee to prepare resolutions, or in whatever other way the Association may be disposed to resolve. It is a discourtesy, and would be far from just to ourselves, to overlook in the slightest degree the solemn fact that such a man has passed away from our midst, and without our having taken proper and sympathetic official notice of our loss. I move that a committee of three be appointed by the Chair to take appropriate action upon the subject of deceased members.

The motion was agreed to; and the Chair appointed Messrs. W. H. White, W. A. Stedman, and Thomas C. Cornell as such committee.

THE QUESTION-BOX.

The President—Having arrived at the end of the list of our regular papers, we will now take up the list of questions. The first one is—

"*Is cannel or naphtha the cheaper enricher—taking $9 a ton as the cost of the former, and five cents a gallon as the price of the latter?*"

Mr. Clark—I have had no experience with cannel, but can say something as to second section of the question. To bring 1,000 cu. ft. of 16-candle coal gas up to 22-candle power, will require 0.750 of a gallon of naphtha—naphtha of 65°—the actual illuminating value of the pure naphtha gas being, say, 60 candles. One man engaged in the duty of keeping up a bench of sixes on naphtha gas will produce enough oil gas to enrich one million cubic feet of coal gas—the naphtha, at 5 cents per gallon, will, of course, cost $37.50.

The President—The question, "Can large gas burners successfully compete with the arc light?" having already been fully answered by Mr. Stein and other gentlemen, we will proceed to the next one; and that is—

"*What is the proper position for gas exhausters?*"

Mr. Greenough—In our works, at the north end of Boston, Mass., we have always been running the gas, first, through the condensers, and then through the scrubber before it comes to the exhauster. Since we have been in the habit of extracting more gas from the coal than used to be our custom we have found a good deal of difficulty because of the presence of thick tar in the inside of the exhauster. It has required a large amount of coal tar naphtha to cut that tarry matter and enable the exhauster to do its duty. We always require a considerable quantity of oil. We concluded to change that plan, and now we take the gas directly from the hydraulic main, and force it through the apparatus afterwards. We have just got to a position where we can estimate what the advantage is going to be. As matter of fact, we found that the saving in coal tar naphtha and in lubricating oil as well, amounted to over $100 per month by reason of the change in the position of the exhauster. But, of course, the exhausters have to do a great deal more work, which takes more steam and more coke—as the exhausters have to run faster in order to handle the same quantity of gas at the higher temperature it now is. The difficulty which we met with before, and which required constant watchfulness, and putting in of naphtha, we have entirely obviated. During the month's working, before I came away, we had no trouble whatever, except when the exhauster was shut down on Sunday. In our case we have certainly found pecuniary savings by reason of this change in position.

Mr. Hyde—Some twenty years ago we had occasion to enlarge our works; and the question of the location of the exhauster came up. As a result of the discussion we determined to put it before the condenser and washer. The gas was delivered to the exhauster at a temperature of about 121°. It had been running for thirteen years without any oil or lubricant. It operated with perfect freedom, which showed that its position was the proper one. About a year ago, however, we put in a new scrubber, and in such position that the gas now reaches the exhauster after having been stripped of the tar; and we find it necessary to use some oil.

Mr. Fullager—We have had the exhauster a good distance away from the retorts for the last fifteen years; and it has not been once taken apart in all that time. We take the gas from the retorts to the condenser, next to the scrubber, and then back to the exhauster. I think that is a good plan to follow. Really, I never knew what it was to have a stoppage in the condenser or scrubber during that 15 years' steady run. I never had to use naphtha nor benzole, nor anything else in a "cutting out" process. The gas travels from 75 to 100 feet from the retort house before reaching the exhauster.

Mr. Harbison—What is the temperature of the gas after traveling that distance?

Mr. Fullager—It goes into the condenser at 130°, and leaves that vessel at 70°—at the exhauster it would be about 75°.

Mr. McMillin—I quite agree with Mr. Fullager as to the proper location of the exhauster. I think I would have it a thousand feet away from the hydraulic main, if I could. I would prefer, however, to put the gas through all the scrubbers under pressure. Therefore I would put the exhauster before the scrubber if I could place it at a sufficient distance. In a works carbonizing 100 tons per day, and where the gas is taken directly from the hydraulic main, they will have to pump four or five tons of coal tar and eight or ten tons of water that they might just as well drop before it reaches the exhauster. The coal we are now using gives almost as many cubic feet of water vapor as it does of coal gas; and it means a very considerable difference in volume if it be taken directly from the hydraulic main to the exhauster, or if it be required to travel three or four hundred feet away. At our works the gas probably travels three or four hundred feet before reaching the exhauster. It passes through two multitubular condensers before reaching the exhauster; and does not pass the standard scrubber until it has issued from the exhauster. One of our exhausters is rated to pass 250,000 cubic feet per day; but it has exhausted three times that quantity in 24 hours. It has been running for fourteen years, and has not been opened within that period.

Mr. Clark—In New Orleans, La., we started at first by taking the gas through four condensers and two scrubbers. We used a great deal of oil, and experienced a vast deal of trouble. This experience led to a change, and now the gas goes directly from the hydraulic main to the multitubular condenser, and then to the exhauster, traveling several hundred feet on the way. From the exhauster it goes through the scrubber and condenser. We now have no trouble with the exhauster, but we had a great deal before. All our apparatus is in vacuum.

Mr. Humphreys—Having such a quantity of apparatus under vacuum, is there not a chance of taking in air, and thus having "blue" lights?

Mr. Clark—We do not exhaust the gas where there will be danger of drawing in air. It passes through the multitubular condenser—but the dry scrubber, the air condenser, and the standard scrubber are only reached after it has passed the exhauster. I have the scrubber and exhauster separated as widely as possible; and remember I put the gas through the exhauster before it reaches the other apparatus.

Mr. Humphreys—There still remains the possibility of drawing in air. I have always thought it best to place the exhauster as near to the hydraulic main as possible, in order to prevent that liability.

Mr. McMillin—I have no such fear. Any break in hydraulic main will be speedily caulked up by the tar. The object in placing the exhauster at such a distance from the hydraulic main is to unload the tons of tar and water spoken of as produced by the coal we are using.

Mr. Gilbert—I know but little about gas engineering, as my duties are connected entirely with the business department of our company. However, I suppose the Association is willing to accept a statement of fact, and I happen to know a fact that may interest the gentlemen who are discussing the present question. Our exhauster is next to the hydraulic main, and about 30 feet from it. It has been so placed for 15 years, and it has answered every requirement with perfect satisfaction.

The President—The next question is—

"*Can the gas engine be successfully used to drive an exhauster?*"

Mr. Helme—I do know where a gas engine was successfully employed in transferring gas from one holder to another; but I never knew of one (alluding to the question just asked) that would permit of an even pressure on the hydraulic main. I think the failure in the latter instance may be traced to the fact that there is not sufficient margin for varying the speed. The attendant in charge of an engine, comparatively new to this market, and now on exhibition at the Franklin Institute display, said he could vary its speed by some 60 or 70 revolutions; or, in other words, adjust the revolutions anywhere between a maximum of 180 and a minimum of 110 revolutions. That variance, however, is not sufficiently great; and hence the reason why gas engines are not more generally adopted, since the steam engine may be adjusted to run at almost any required scale.

The President—Not only do we encounter the difficulty spoken of by Mr. Helme, but we also find that the gas engine requires to be cleaned frequently.

While you must shut down every few days to clean out the cylinder of the gas engine, the steam engine runs along steadily. The next question is—

"*What is the best method of removing tar from the gas?*"

Mr. Clark—At New Orleans we are using the Pelouze & Audouin condenser. The gas passes through it at a distance of 150 feet from the hydraulic main. This condenser effectually performs its duty.

The President—Has anyone present had experience with the frictional condenser, or removing the tar by means of the hot scrubber?

Mr. Hyde—Some ten months ago we put up in our works (Cleveland, Ohio,) a hot scrubber. Prior to its erection we were troubled somewhat from tarry stoppages in condenser pipes at a point close to where the gas made exit from the scrubber. Pipes of 24 inches diameter ran underground to purifying house—say for a distance of 130 feet—and at the end of that pipe line, or at entrance to boxes, tar would be deposited, I might say constantly. With the scrubber in operation for a short time, the deposit of tar in the line of 24-inch pipe ceased, although a trifling deposit would sometimes take place in the boxes. No tar showed in the condenser pipes. The scrubber is a good machine, but does not answer all the claims made for it by its inventors. They claim that gas passed through it would not stain test paper; but the paper shows differently. Nevertheless, it removes the tar, and does that so completely that we now have to oil our exhauster—a new experience with us. Another unfavorable result I should mention. Since the new scrubber was put in naphthaline has made its appearance in the tubes of condenser; also at other points in the apparatus. I would not wish to ascribe the naphthaline trouble to the introduction of the hot scrubber; but the circumstances look suspicious. I must confess the new phase is one upon which I had not made any speculation. It is possible that the "efficiency" of the scrubber is such as to remove from the gas some of the vapors that ought not to be carried off—vapors which are essential to sustain the carrying off of this naphthaline in a state of suspension.

Mr. Geggie—At Quebec we employ the St. John scrubber, and do not know what tar is. Not a particle of tar shows in our "Standard" scrubber. That vessel removes it completely.

Mr. Nettleton—Mr. Wood employs a scrubber at the Syracuse (N. Y.) works which is remarkable for efficiency. I would like to hear from him in regard to its results.

Mr. A. C. Wood—We have a friction scrubber, and it appears to take the tar out effectually. None shows in the exhauster. The gas passes through the dry scrubber into the exhauster, and then on to the condenser and wet scrubber. No tar shows beyond the friction scrubber.

The President—We now come to the question—

"*Does a heavy setting of retorts require more coke to maintain the heat than a light setting?*"

Mr. Stedman—In order to keep the ball moving, I say "Yes."

Mr. Lansden—And I say "Yes."

The President—I would like some of the gentlemen to explain what they mean by heavy settings. I think the question is indefinite. Colonel Stedman's conception of a heavy setting may differ entirely from that of Mr. Lansden. It is a matter of degree, almost exclusively. It is so indefinite that we will proceed to the next question—

"*What is the best and most expeditious mode of weighing coal when discharged direct from vessels into store?*"

Mr. Harbison—With horizontal scales, and large quantities at a time.

Mr. Humphreys—A party has told me that he discharges coal directly from the vessel into his coal bins, and takes the bill of lading weight, but is very sure that he does not get what the bill of lading calls for. He wants to learn of some expeditious way of weighing the coal as it comes from the vessel to the shed. I suppose he uses a bucket running over a wire rope.

Mr. Helme—The coal carrying railroads have an excellent system of weighing coal; and the iron smelters are adepts in the matter of weighing either coal or iron ore supplies. Very complete scales for the purpose are made by Riehle Bros., of Philadelphia. I would suggest to the questioner to make a trip through the Lehigh Valley. He will be sure to there see what would suit him.

The President—We now come to the question—

"*If, say,* 4,000 *tons of coal are stored for a year's supply, what is the average loss in weight when re-weighed in the retort house?*"

Mr. Humphreys—Our experience at Lawrence, Mass., shows a loss of 1½ per cent.

Mr. Fullager—You will find, in report of proceedings of last meeting of the Ohio Gas Light Association,* a statement of experience gained by the Cincinnati Gas Company in regard to this matter. If I remember correctly, the coal sample taken from portion of heap nearest roof of shed showed a loss of 9 per cent.

Mr. Harbison—We store all our coal in a brick structure covered by slate roof. Some years ago I allowed 2 per cent. for shrinkage; but when the spring season was reached I found that we had a greater quantity of coal on hand than our book accounts called for. I decreased the allowance for shrinkage to one per cent.; but that figure proved to be too large. The one per cent. figure was made on a total storage in sheds of 10,000 tons of coal—8,000 tons of same being caking coal. Our loss is less than one per cent. When buying coal we weigh it on our own scales. The agents who sold to us gave us the option of buying either by their bill of lading or by the weight as determined in our yard. We adopted the latter proposition.

Mr. Nettleton—At our Birmingham (Conn.) works my former practice was to add one per cent. to the weight of coal carried into the retort house, but found that that allowance was not sufficient. Since then I have added two per cent., and am about right.

The President—Here is a rather important question, and one that will require some consideration. It is—

"*What is the cause of the stopping up of gas burners fed from a dead end of a gas main?*"

Mr. Stedman—Is it a fact that the stopping up of consumers' burners fed from a point close to the "dead end" of a main is the result of forming a "dead end." Is that the general experience? My experience goes to show that where we have a "dead end" which has existed for several years, at the end of two or three years all annoyance from stopped burners would cease. At the end of the period noted we had no greater trouble near the "dead end" point than at the center of same line of main. I must say we almost invariably notice, when we join a new section of pipe to a length that did terminate in a "dead end," that trouble will be experienced by the consumers. The trouble will last for perhaps two or three years—or until the consumption has materially increased.

Mr. Harbison—Does Mr. Stedman, after putting down, say, 500 feet of pipe in a street not previously piped, and with a consumer taking gas from near the end of extension line, find that such consumer has trouble with his lights?

The President—The question is, What causes the stoppage of gas burners? There can be no doubt that the trouble does occur. I think we all find that burners fed from near the "dead end" of a long line of pipe do stop up. The gas at the end of the main seems to be richer (or of a different character) than at points where the supply is in active circulation.

Mr. Littlehales—A case of the sort under discussion came under my observation a couple of years ago. I had an interest in a small plant, and its mains were increased by the placing of about a mile of pipe to reach two consumers. For some time afterward the consumption drawn from the particular line was quite small. When we had "drawn off" the pipe, as we thought completely, I presume some air was allowed to remain in it; and as (during the daytime) the pressure was kept at a very low point, I concluded that the consumers' burner stoppages were occasioned by the presence of the trifling quantity of air in the pipe. I argued that this trifling percentage of air made the flame very much hotter at the burner tip. Also, in the case of "dead ends," when the pressure is rather low, slight leaks, either in the pipe itself or at the joints, will permit the harmful percentage of air to work in.

Mr. Harbison—Although it does not have a direct bearing on the question I may state that our Hartford experience, in regard to encountering difficulties at "dead ends" of mains, differs entirely from that related here. Two years ago this fall we laid 6,000 feet of pipe in order to reach one consumer—and we still have but the one consumer on that pipe line. Of course the consumer takes up a large quantity of gas, but not a single complaint has been made with regard to the burners in the building so supplied. We laid another line, over a distance of 4,000 feet, to reach a single customer, and no difficulty has been reported—not even in the case of the working of a gas stove which that consumer has been operating ever since our mains reached the stated point. We have twenty other such places in Hartford; and yet I have never heard it perhaps even suggested that any burner difficulty could be traced to the fact that the supply was derived from the "dead end" of a main.

Mr. Littlehales—Mr. Harbison's experience may possibly be accounted for on the score of sufficient pressure through the 24 hours. That would keep the air out of the pipes. In the case referred to by me the trouble noted ceased after the first winter.

The President—One point has not been explained, and it relates to the fact that the gas at the end of dead ending mains seems to have a higher illuminating power than it possesses where it is in active circulation. Can this be accounted for by the principle of exosmose? The hydrogen of the gas passing through the pores of the pipes leaves the gas in a much richer condition, then the non-illuminating gases present do not, in combustion, develop enough heat, and when it burns it leaves a deposit of carbon. We know that that action takes place.

Mr. McMillin—To my mind that would be the only way of accounting for trouble of the kind under discussion. I think it is not true in these cases

* See JOURNAL, Vol. XLII., p. 285.

that the carbon is consumed at the burner, but rather that it is deposited. The deposit might be owing to the absence of a sufficiency of hydrogen in the gas. I am inclined to believe with our President; and hold that his explanation is the correct one.

The President—The next question is—

"*Will a change of water in the tank tend to a depreciation in the quality of gas in the holder?*"

Mr. Gilbert—I asked that question, but a gas engineer or a chemist would not have occasion to make the query. However, it was a matter of much importance to my company. I thought I might possibly obtain information which would justify the running of a stream of water—say, at a temperature of 50° or 60°—through the tank, and thus prevent ice from forming in it. Professor Douglas informed me (I expect that most of the gentlemen present will agree with him) that such a procedure would have a tendency to reduce the illuminating power of the gas. It seemed to me that running a stream of water (at a temperature of 50° or 60°) into water of a tank that was pretty near the freezing point (if it did not raise the holder to the point of allowing the entering water—which, being warm, would naturally rise to the surface—to get under the bottom of the holder) could not in any way prejudice the quality of the gas. I so thought because the warm water flowing into tank would be the first to run off; and that, unless too great a volume was admitted, it would not reach a point sufficiently low to find its way under the holder, unless the holder floated very near the top. We have had a great deal of trouble in keeping the ice formation out of our tank, and were especially bothered that way during last winter, which was an exceptionally severe one in our locality. If we could prevent the ice formation, by using (in the manner indicated) the water from our artesian well (its temperature runs between 50° and 60°), it would mean quite a saving in money to us.

A Member—We have employed that identical process during the last 15 years. We have been running spring water directly under the surface of the tank water, giving the entering stream a certain direction. We have always kept our tanks free from ice by that means, and have never raised a pound of steam for such purpose.

The President—The next question appears to be—

"*Can a steam boiler be heated by the waste heat of the retort benches; if so, how?*"

Mr. Helme—I do not know to what extent it can be done. I saw it done several years ago, at Phillipsburgh, N. J., and the practice was most successful. They had two benches of threes; also a "spare" arch in which the boiler was placed. They appeared to get more steam than was needed. At New Albany, Ind., the superintendent set a boiler about ten feet from the end of the benches, and brought a pipe down from top of bench carrying the pipe then along underground; and I was surprised to see how well the plan operated. I asked him if it did not affect his draught; and he replied, "No, not in the least." His heats in benches (he was working two) were really good. I satisfied myself that the thing was quite practicable; and, in fact, very desirable in small works.

Mr. McMillin—I propose to try the experiment this year. We have an underground flue which conducts the waste gases from 8 benches to a chimney 85 feet high. The flue is 30 inches in diameter. I know there is sufficient heat there to evaporate a great deal of water, and still have a temperature high enough (with that tall stack) to give me all the draught I want. I shall try it, and arrange it with by-passes, so that I may abandon it if it fails. I do not expect to meet with failure. Of course, we cannot take all the heat out of our furnace coke and have enough left to carry on a subsequent operation; but I claim that we do not get the full value of the coke in the furnace. Some portion of the heat is going to waste, and it is possible to utilize it.

Mr. Gilbert—Our own boilers were originally fed with water from the city water works, at a pressure of about 60 lbs. to the inch. We afterwards directed the full head of water into a smaller boiler placed directly over the retorts, from thence (maintaining the original pressure, less the friction) led the supply into the principal boiler, and secured a very material saving in the amount of coke used in generating our steam.

Mr. Pritchard—At Lynn, Mass., we have a boiler located on a flue, and have succeeded in making steam enough (without an extra charge for fuel) to operate our exhausters during five months of the year.

Mr. Thomas—I think Mr. Wood, of Syracuse, N. Y., has made some experiments in the matter of heating boilers according to the plan under discussion.

Mr. Wood—I have experimented on this subject in several different ways, and the general result has been a saving in fuel. I have placed the boiler on top of stack, in connection with the flues, also in various other ways. It absorbs the heat from the bench, and requires but little additional amount of fuel to keep up the necessary temperature. I have tried to carry that heat off by means of a hot air flue (built independent of the main flue), and then tried to make steam, but with the usual result. The requisite temperature was gained at the expense of the heats in the bench.

Mr. Helme—In regard to keeping the water in boilers at the same level, I can say that at Atlanta, Ga., we never open the gauge cock. We have a glass gauge. The water level does not vary one-quarter of an inch from year to year. It is managed by suspending from an overhead beam an ordinary spring balance, somewhat like those you see on the safety-valve lever of a locomotive. We suspend to that a vessel which is, in my case, 10 inches in diameter and 10 inches long, made out of ordinary boiler iron. Two inches from the top of that we run in a small pipe—I think it is one-quarter of an inch in diameter and about four feet long. Two inches from the bottom I have a half-inch pipe—it will spring quite readily in that length. The water line is halfway between those two pipes. I keep the small pump running all the time. Right under this is the pipe coming from the water tank which is kept near the roof. When the water is at the proper point this cock is just shut. As the water is evaporated from the boiler, as matter of course, it is evaporated from this vessel. Having a pipe above and below, the water will maintain the same level in both. The spring draws it up and *opens* the cock below, admitting the water to the pump, which forces it into the boiler. When the water again reaches the proper point the spring is stretched and the cock is closed. It is a very simple arrangement, and I can vouch for its reliability. We have three gauge cocks, and they have not been opened in nine years.

Mr. Wood—This question may be illustrated by the method of utilizing heat pursued by those engaged in the manufacture of salt. Perhaps at no other place in the United States has the study of heat economy been carried to a greater length than at Syracuse, N. Y., where they are manufacturing such immense quantities of salt each year—a large proportion by evaporation, and another large proportion by the aid of artificial heat. From 75 to 100 kettles are placed in a row, and at one end a fire is started underneath them. A brick arch extends right through underneath the whole row, and connects with a chimney stack at the opposite end. Where each four kettles come together there occurs quite a space; the space, of course, is bricked over. That forms a hot air chamber. One manufacturer thought to utilize that space, and thus increase his salt production without increasing his fuel account. He thought he could put an additional kettle to every series of four—replacing the brickwork by the bottom of a kettle, drawing the cold water into the kettle, and causing it to be heated by the waste heat. The experiment was continued carefully over some weeks; but our manufacturer found that he did not increase his salt production by a single ounce, in proportion to the quantity of coal consumed. The fifth kettle simply absorbed the heat from the other four. I saw the same thing illustrated, in a similar way, at New Haven, Conn., where boilers were erected on top of the stacks—so managing the flues that they could turn the heat from one or more benches to the boilers. It was found that the water absorbed the heat from the benches.

Mr. McMillin—I shall have to challenge the last statement. I think the rest are all correct. The salt makers were already getting all the heat there was in excess; but erecting boilers over flues on top of benches cannot absorb the heat from those benches. That would be, to my mind, an impossibility. The draught might in some way be obstructed, and thus the falling off in bench heats might be explained. You may fail to utilize the heat; but I do not believe the New Haven failure may be traced to the bare fact that the boilers were on the flues.

Mr. Wood—There was no obstruction in that case.

Mr. Helme—The New Albany arrangement could not interfere with the bench at all. I was surprised to see what good heats they had there.

The President—When gas leaves the furnace at a temperature of 600° I do not think there can be any doubt (if you get the flue away from the bench) that you ought to be able to utilize the waste heat in the production of steam.

Mr. Lansden—During the proceedings of the Western Gas Association a paper was read* which explains the New Albany case.

At this point the second day's proceedings were declared adjourned.

THIRD DAY—FRIDAY, OCT. 23.

The Association was called to order at 9:30 A.M.

LIMITING THE AMOUNT TO BE EXPENDED BY COMMITTEE ON EXHIBITION OF GAS APPLIANCES.

Mr. Greenough—There was a resolution passed yesterday with regard to the meeting to be held at Philadelphia, which provided for the appointment of a committee to arrange for an exhibition of gas appliances. It seems to me, on reflection, and after consulting with other members of the Association, that the resolution, as it was drawn with regard to the expenditures of that committee, was not put in exactly the position in which it ought to leave the Association. The committee, as the gentlemen will probably remember,

* See JOURNAL, Vol. XLIII., July 2, 1885, p. 6.

was authorized to draw upon the funds in the treasury to an unlimited extent. Without reflecting in the slightest degree upon the good judgment (and also their desire to do exactly what is right) of the gentlemen who form this committee—and not only in this case, but as a precedent for other committees which may be appointed hereafter—I think it is proper that the amount they shall be authorized to draw from the treasury shall be limited by a vote of the Association. I therefore move to amend the resolution passed by the Association yesterday by authorizing the committee to draw upon the funds of the Association to an extent not exceeding $250.

The amendment was agreed to; and the resolution, as amended, was again adopted.

Report of Committee on Memorials.

Capt. White, from the Committee on Memorials of Deceased Members, presented the following report and resolutions:

To the Members of the American Gas Light Association:

Gentlemen—Your Committee upon Deceased Members respectfully reports the following preamble and resolutions:

Whereas, The increasing years of this Association bring with them the penalty nature attaches to all human institutions, and with them we bear in common the common destiny; each recurring year lengthens the sad roll of associates who, laying down the cares and duties imposed by life, "pass to the silence among the silent dead."

Resolved, That we mournfully add to the necrology of the Association the names of our late fellow-members and friends, Thomas Butterworth, George Cornell, I. Herzog, Francis Thompson, and Philip Peebles, in full realization that in their passing away the profession and ourselves have met with an irreparable loss—so much of manly character, earnest, zealous life, and professional attainment passing with their lives into the all-destroying tomb.

Resolved, That the Secretary be directed to prepare and publish in Vol. 7 of the Proceedings of the Association full and proper notices of the lives of these our deceased members, and to convey to their families, by letter, our expressions of sincere regret and sympathy in their bereavement.

Wm. Henry White,
Wm. A. Stedman,
Thos. C. Cornell, } Committee.

On motion of Mr. Lansden, the action of committee was unanimously endorsed by a rising vote.

Supplementary Report from Executive Committee.

Mr. A. B. Slater, from Executive Committee, presented the following report, which was, on motion of Mr. Harbison, accepted:

The Executive Committee has considered the subject of changing the date whereon to hold the annual meetings, and unanimously recommends that no departure from, or change in, the usual custom be made.

Votes of Thanks to the Officers.

Mr. Stedman—As our meeting is about closing, and before we reach the end of one of the most successful, gratifying, and satisfactory gatherings that the Association has ever enjoyed, it seems due—not merely because it is a custom heretofore followed, but because I think that I voice the sentiments of every member of the Association in offering it—that a resolution of thanks should be tendered to Mr. Eugene Vanderpool (our presiding officer) for his faithful and impartial discharge of the duties of his office. I, therefore, submit the following:

Resolved, That the thanks of this Association are due, and are hereby tendered, to President Vanderpool for the able and effective manner in which he has discharged the duty of presiding officer at the sessions, and which so largely contributed to their great success.

The motion was put by President-elect A. C. Wood, and the response to question of its adoption was unanimous.

President Vanderpool replied—I thank you, gentlemen, for this expression of your consideration; but, at the same time, I regret that I could not have filled the duties of the position in a measure equal to that of my desire, and nearer to the manner in which those duties should have been discharged. I feel that the meeting has been very successful—perhaps more so than any other one we have ever had; but I think that that success is due not at all to your presiding officer, but rather to the members, because of their attention to the proceedings, and their participation in the interesting discussions which we have had; and also to the fact that our Committee of Arrangements had provided such an excellent place wherein to hold our convention. Very much also of our success is due to the arduous duties performed by our worthy Secretary, who has for a long time been devoting a great deal of time and zeal to the interests of this organization. It is due to him to say that the success of this meeting is more largely traceable to him than to anyone else. I propose, therefore, a resolution of thanks to our Secretary for the effective way in which he has contributed to the success of this convention.

The resolution was unanimously adopted.

In replying Secretary Humphreys remarked—I am exceedingly gratified at the kindly appreciation expressed by your vote; but I think the credit of our success is more largely due to the members who have acted on my invitation to present papers at this meeting than it is to the Secretary himself; and I wish, personally, to thank those gentlemen who have responded in so satisfactory a way to my appeal for their literary contributions.

On motion of Captain White, the thanks of the Association were tendered to the Cincinnati Gas Light and Coke Company for its very courteous treatment (and its hearty and splendid entertainment as well) of the members. The Secretary was instructed to convey such thanks to General Hickenlooper, President of the Company. On motion, a vote of thanks was tendered to the Committee of Arrangements. The maker of the motion (and the sentiment of the members was in hearty accord) complimented the committee upon the happiness of its action and the completeness of its efforts.

Here the business sessions of the 13th annual convention were declared adjourned *sine die*.

Official Report of Tests Rendered by the Judges in Regard to Efficiencies of High-Power Gas Burners as Displayed by the Siemens Regenerative Gas Lamp Company in its Exhibit at the Late "Novelties" Exhibition.

The facts and figures below recorded are the official utterances of the gentlemen appointed by the Franklin Institute, of Philadelphia, Pa., to examine and report upon the efficiencies of the improved forms of gas burners exhibited at the "Novelties" Exhibition—in so far as the said utterances relate to the specimens of burners shown by the Siemens Regenerative Gas Lamp Company. The report is dated Nov. 5, 1885.

The Siemens Regenerative Gas Lamp.

This lamp shows most strikingly the great progress that has been made in methods of gas lighting, consequent upon the development of the electric light. Invented at a time when the highest efficiency attained was but little over four candles per foot of gas, almost at a single stride Mr. Frederick Siemens raised the standard to nearly or quite ten candles per foot (with the most suitable gases for use in this lamp). In so doing he not only secured great economy in the lighting of large spaces, but gave improved ventilation and also a far better quality of light.

With his long experience in the adaptation of the regenerative principle to furnaces, he brought to the problem a knowledge which gave him a comprehensive grasp of the subject in all its bearings, and enabled him not only to produce the best gaslight then known, but also to illustrate forcibly certain principles which would alone enable us to secure the highest results in illumination by the use of gas.

It is not possible to clearly explain the construction of this lamp without detailed drawings; but inasmuch as its form can be greatly varied without changing the principle of its action, we think that a detailed description of the lamp tested by us is not necessary.

The central principle, on which its efficiency depends, is the heating of the air and gas intensely before they reach the zone of combustion, by bringing them into the lamp, and to this zone, and in contact with metal surfaces, heated to a high degree by the waste gases which are passing away from the flame. The flame is therefore hotter, and the light more intense.

This heating or regenerative action is also cumulative, and increases with the rising temperature of the flame. If there were no loss by radiation and the like, the heat would increase until the entire structure would be destroyed. Practically the heat does not increase beyond a point which the lamp endures safely. The waste gases are conducted by a metal pipe to a flue after they have done their work in the lamp, and the air of the room is left pure and uncontaminated.

A large number of these lamps are now used in the public squares of this city, notably in Franklin, Rittenhouse, and Logan. The squares are made far more attractive and safer than before. The lamps are also used in many other places in the lighting of buildings and the spaces about them.

Our tests of this lamp were made on a bar photometer, with a length of 280 inches between the lamp and our standard. Our standard was a Sugg argand burner, rated to pass 5 feet of gas per hour.

Horizontal Test of Siemens Lamp—Made Nov. 3, 1885.

The candle power of our standard and city gas was 17.71 candles.

Test No. 1.—Gas burned per hour (cu. ft.)	.....	51.18
Candle power	.....	364.65
Candles per foot of gas	.....	7.12
Test No. 2.—Gas burned per hour (cu. ft.)	.....	51.18
Candle power	.....	463.11
Candles per foot of gas	.....	9.04
Test No. 3.—Gas burned per hour (cu. ft.)	.....	48.00
Candle power	.....	396.52
Candles per foot of gas	.....	8.26

It is proper to state that all of the above tests were made at one heating of lamp.

In view of the foregoing, your committee would award the Silver Medal of the Franklin Institute to the Siemens-Lungren Company for the Siemens Patent Regenerative Gas Lamp, together with a diploma of the Institute.

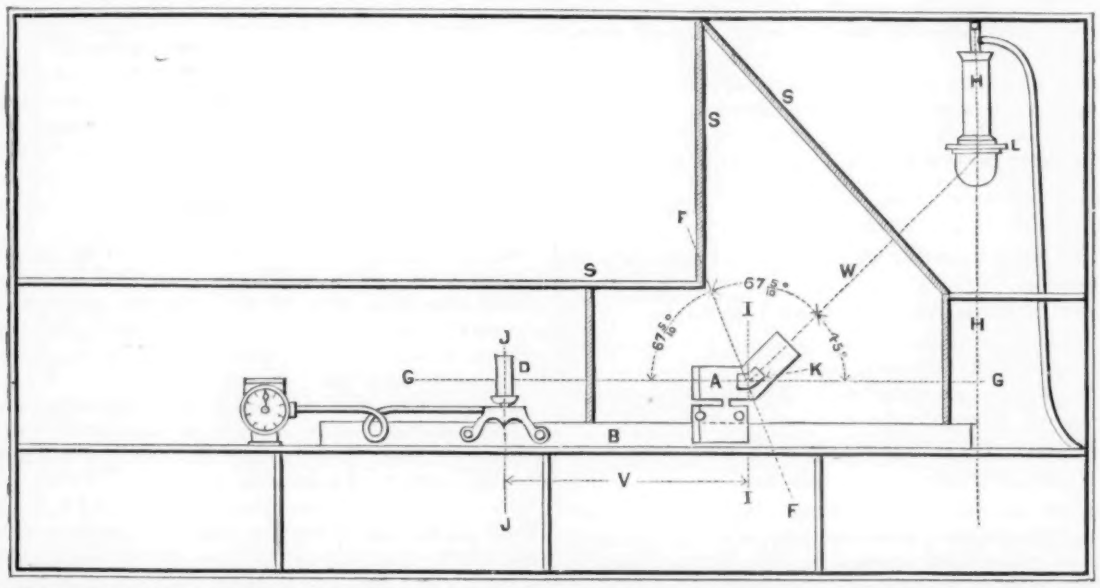
The Lungren Inverted Regenerative Gas Lamp.

This lamp owes its efficiency to the heating of the air and gas which enter the flame by means of the waste heat which is leaving the lamp. Resembling in this respect the Siemens lamp, it has peculiarities which render it noticeable, and increase its value to a marked degree.

The flame and the illumination is all below the structure of the lamp itself; there are no shadows; and the light thrown down from the suspended lamp is entirely unobstructed. The lamp is also of a form and structure which admits of its use in a variety of places where the Siemens lamp could not be used so conveniently. Finally, its efficiency is much higher than that of the Siemens lamp, in small and medium lamps such as are used in the lighting of offices, stores, and apartments of moderate dimensions. Its value for general illumination is for this reason greater.

The quality of the light for brilliance, steadiness, and color is unsurpassed; and the lamp itself is simple in its construction and of a pleasing and agreeable design.

In measuring the light of the lamp your committee found it necessary to construct a photometer for the angular measurements. Horizontal measurements were made on the bar photometer used in testing the Siemens lamp. The flame of this lamp being entirely below the lamp, however, the horizontal rays do not represent its efficiency in actual use.



Photometer Used in Measuring Flame from Lungren's Inverted Regenerative Gas Lamp—Angle of 45 Degrees and Vertical. *A*, sightbox, stationary on photometer bar; *B*, bar of photometer, stationary on table; *C*, wooden clamp, to carry sightbox for adjustment; *D*, standard argand, moves freely along the bar from end to clamp, *C*; *L*, lamp to be measured, suspended over the bar; *F F*, line through sightbox, 67½ deg. above horizontal line *G G*; *G G*, horizontal line passing through center of argand and sightbox; *H H*, center line of lamp to be measured; *I*, perpendicular line passing through the center of illuminating screen; *J*, center of argand and pointer on carriage of same; *K*, center of disk in sightbox, on line *G G* and *I I*; *S S S*, screw-boards, to cut off all but direct rays of light from sightbox; *T*, candle power of argand; *V*, distance from *J* to *I*; *U*, candle power of lamp being measured; *W*, distance from *K* to *L*.

The series of measurements at horizontal were made as follows:

The lamp was suspended in line with the bar at the end, and its light was compared with that of the Sugg argand used in testing the candle power of the city gas. Date of tests, Oct. 31, 1885.

Illuminating power of city gas equal 17.69 candles.

Test No. 1.—Gas burned per hour (cu. ft.).....		16.44
	Candle power.....	124.71
	Candles per foot of gas	7.58
Test No. 2.—Gas burned per hour (cu. ft.).....		17.85
	Candle power.....	155.84
	Candles per foot of gas	8.70
Test No. 3.—Gas burned per hour (cu. ft.).....		17.25
	Candle power.....	157.62
	Candles per foot of gas	9.12

Result of Measurements at Angle of 45° below the Horizontal Line.—For this test we had a sightbox made, which was mounted stationarily upon a bar, as shown in the sketch. The disk in the sightbox, *A*, was placed coincident with the line *F F*. Therefore, the light from the lamps *D* and *L* entering the sightbox at opposite ends thereof, the disk was illuminated equally when the carriage, and its Argand, *D*, were placed so that, $V^2 : W^2 :: T : W$.

All the distances having been accurately measured before the test (except that from *J* to *I*) the standard lamp, *D*, was moved along the bar in each reading until the illumination was equal upon the two sides of the screen, precisely as in the usual tests for candle power with the common sightbox and candle, the difference being solely in the fact that our standard, and not the sightbox, was moved.

The average of ten observations, in this way, gave us the distance, *V*, from *J* to *I* in each test. The other distance, *W*, being known already, the candle power was readily determined.

Tests made Nov. 5, 1885. Candle power of city gas equal 18.60 candles.

Test No. 1.—Gas burned per hour (cu. ft.).....		16.20
	Candle power.....	197.16
	Candles per foot of gas.....	12.17
Test No. 2.—Gas burned per hour (cu. ft.).....		16.55
	Candle power.....	231.78
	Candles per foot of gas.....	13.90
Test No. 3.—Gas burned per hour (cu. ft.).....		17.20
	Candle power.....	230.64
	Candles per foot of gas.....	13.40

Vertical Test.

The lamp was suspended over the vertical end of a sightbox, made so that the horizontal rays from our standard Argand, and the vertical rays from the Lungren lamp fell, as in the previous test, upon the opposite sides of the same screen—the screen in this case being at an angle of 45° to the lines of light falling upon it.

The light from the suspended lamp entered the sightbox through a round hole in a wooden screen placed over it, and the standard Argand was moved, as in the previous tests, in making each observation. The average of ten readings gave us the distance from which the candle power was determined.

Vertical test of Lungren lamp, made Nov. 5, 1885. Candle power of city gas equal 18.60.

Gas burned per hour (cu. ft.).....		16.00
Candle power.....		223.86
Candles per foot of gas.....		13.99

In view of the advantages of this lamp, as stated previously, and of its remarkable efficiency as shown by these tests, we would recommend the award of the silver medal to this lamp, together with the diploma of the Institute.

Furthermore, in view of the fact that the Siemens-Lungren Company have established the manufacture of the Siemens and Lungren lamps, in a way to supply the demand in all the required sizes thereof, and have added a new and valuable industry to those already established in the city, we would recommend the exhibit to the Committee on Science and the Arts of the Franklin Institute for further award. [Signed.]

Will Make no Water Gas.—Owing to the noxious odor evolved, the Staten Island (N. Y.) Gas Light Company will discontinue the manufacture of gas under the Flannery patents and process. Coal gas is good enough for the people of Richmond county.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, Jan. 10, 1885.

What Shall we Do with the Tar?—Dublin Public Lighting—Bradbury & Hirsch's Circular—The Great Gas Engine Case—Gas at Sixty Cents per Thousand Cubic Feet.

A little while ago I mentioned that Mr. J. Orwell Phillips, the energetic secretary and manager of the Gas Light and Coke Company, had brought forward a scheme for the disposal of the London sewage; and if that gentleman could bring out, by dint of his known remarkable abilities, an equally ingenious plan of disposing of coal tar, he would earn the gratitude of the profession. For the cry of "What shall we do with the tar?" which I repeated last month, still re-echoes on every side, and continues to be the current topic of the day. Some comfort may be derived from the fact that Col. Sadler, of Middlesborough, has been making an extensive series of experiments on a practical scale, which go to show that creosote oil and such like hydrocarbons will compete very favorably with steam coal as a fuel for use in the steamships of the Royal Navy; and it follows, as a natural consequence, that they are equally applicable to all other kinds of steamships. The *Journal of Gas Lighting* thinks there is not much connection between cheap tar and steamships; but we have an old proverb, "Why spoil the ship for a ha'porth of tar?"—and a sailor is vulgarly called "an old tar." If the at present almost valueless coal tar, in addition to providing the pitch for caulking the exterior of the vessel, proves also capable of furnishing oil for maintaining the steam pressure in the boilers, these expressions will possess a significance and force which they never had before; and, better than this, the revenues of gas companies will improve. The exact details of the process followed by Col. Sadler have not been published; but it appears that the liquid is maintained at a certain temperature in a tank by means of steam coils, presumably for the purpose of rendering it perfectly fluid; and from this it is delivered and injected into the furnace by the aid of a steam jet.

The Dublin Corporation includes amongst its members a certain Mr. McEvoy, who for some reason or other is very much opposed to the Dublin Gas Company and everything pertaining to the gas supply. For some years past he has been agitating in the Council, to the effect that the people are treated injuriously in the matter of the public lighting, and that a quantity of gas considerably in excess of that actually used has been charged and duly paid for. Nor has he scrupled to allege that this is due to something more than neglect or inadvertence. At his instigation a sub-committee has been specially appointed to consider the matter, and the accounts have been passed on from the Corporation Gas Inspector to the City Accountant for examination. It should be mentioned that the average meter system is in use, which is generally conceded to be the fairest of all methods for determining the quantity of gas consumed by public lamps; but Mr. McEvoy appears to have got hold of the notion that the meter indications were "fast," or else that the arithmetical part of the business was manipulated in some underhanded manner, so as to put an extra sum of money into the pockets of the gas company, and to leave the coffers of the Corporation minus that precise sum. Such appears to be the grievance of Mr. McEvoy and his friends. The sub-committee found themselves in need of professional advice, but such was their prejudice against everything connected with gas and gas engineers they really seem to have been doubtful as to the possibility of meeting with a perfectly honorable expert who might be relied upon to give them an unbiased opinion. In this dilemma a happy thought occurred to them. They would have an "independent scientist" to investigate the matter. What could withstand the searching investigations of an "independent scientist," before whose piercing gaze all roguery and chicanery should shrivel up to nothing! A gentleman answering to the character was found in the person of Professor Wanklyn, who perhaps secured the good will of the committee by the fact that he has recently said hard things against gas engineers. The Professor has certainly acted up to the part required of him; possibly too much so to suit the McEvoy clique, who are fairly hoisted with their own petard by his report, which sets forth that any defects in the apparatus or carelessness in the procedure with respect to the public lighting go against the gas company and not the corporation; and that the gas was well within the prescribed limits of illuminating power and purity. Mr. McEvoy, however, not caring to admit the evident truth that all this fuss has been a veritable storm in a teapot, has not allowed Prof. Wanklyn's report to pass before the Council, but has embodied it in one prepared by himself, in which he attempts to obscure the plain facts arrived at; but doubtless recognizing the fact that this proceeding will not hold water, he has shifted his ground and made a violent, but nevertheless a weak, attack on the price of gas charged by the company, and the whole matter has settled down into an attempt to obtain a reduction in the price of gas. Mr. Cotton, the secretary of the gas company, has addressed a letter to the Mayor and Corporation, in which the fallacy of the position taken up by Mr. McEvoy is conclusively shown.

Messrs. Bradbury & Hirsch, of Mason's Buildings, Liverpool, have issued their usual annual review of the market for sulphate of ammonia. It has been somewhat modified in form as compared with preceding editions, and the alterations are such as to render it still more interesting and useful to gas engineers. The report is now arranged in three sections—agricultural, showing the bearings of agriculture upon sulphate; chemical, relating to the production and distribution of ammonia; and commercial, dealing with current values, exports, stocks, etc. It is satisfactory to notice that the review fully supports the opinions current amongst gas engineers in this country, to which I have from time to time given expression in these letters, to the effect that producers have been hardly and unfairly dealt with. So much may be inferred when it is shown that there has been no falling off in the demand, no excessive production, and no cheaper or better competitor. The cause of the great diminution in price is ascribed to general depression in trade, and to the present poverty and corresponding low purchasing power of the farmer; and especially to the action of speculators in unscrupulously turning this condition of affairs to their own advantage, and forcing an artificial lowering of values on the market. Messrs. Bradbury & Hirsch are fully in favor of combined action on the part of producers, and think that better times are in store, though of course the high prices attainable a few years since are not likely to be regained. The first part of the report might well be printed by makers of sulphate for distribution amongst farmers in the neighborhood, with a view to the development of a local trade. In England some 90 per cent of the total production is exported, whilst, at the same time, ammonia is largely imported in other forms; so a better understanding between producer and consumer might result in a considerable proportion of the money that is now being spent in freights remaining in their own hands.

The great gas engine case, alluded to in my last letter, is concluded, and in a manner that will be fully satisfactory to the plaintiff, and equally unacceptable to the defendant. It will be remembered that Dr. Otto, the originator of the well-known Otto and Crossley gas engine, sued Mr. Steel, a maker of gas engines, for infringement of patent; and the defence raised was not anything in the way of denial, or dispute of Dr. Otto's assertions, but an attack upon the validity of the patent itself, by a claim that it had been previously anticipated. So the case was reduced to comparatively narrow limits, and these even further diminished by the decision in the case of Otto vs. Linford, tried some years since. Yet to decide whether anyone had previously described the use of a mixture of gas and air in a cylinder, in a manner that could be proved to cover the claims of Dr. Otto's specifications, was a work that occupied Justice, counsel and professional witnesses for no less than sixteen days. Proceeding at this rate, it would be an interesting problem to those versed in abstruse arithmetical calculations to determine how long a trial involving the whole specification would last. The defence chiefly relied upon the point that Dr. Otto claimed to have a "cushion" of incombustible air or residuum next to the piston, and this they proved, by evidence and experiment, to be incorrect. So far the facts are correct, but Justice Pearson ruled that Dr. Otto's specification did not specifically insist on their being a distinct cushion of incombustible matter next to the piston separate from the combustible charge of gas and air. He came to the conclusion that the mixture, when fired in Dr. Otto's engine, is heterogenous, and not homogenous, in its composition, and that it had exactly the effect described by Dr. Otto in his first claim. He also decided that the claim of anticipation had not been proved, and, therefore, that Dr. Otto's patent was a good and valid patent. So he made a decree of injunction, with costs on the higher scale. The gas engines in the possession of Mr. Steel are to be given up or rendered unfit for use; but, on the application of this gentleman's solicitor, this part of the decision was allowed to stand over for a month.

It is worthy of notice that this verdict is directly opposed to judgments that have been delivered both in French and German courts, and it has consequently created some surprise on the Continent.

A little while since I noted that the South Metropolitan Gas Company, of London, had announced their intention of reducing their price for gas to 2s. 6d. (60 cents) per 1,000 cubic feet, on the 1st inst; another London gas company (the Commercial) has now decided to follow suit at an early date. The former undertaking, in notifying the reduction to their customers, has very pertinently taken the opportunity to point out that, at this rate, gas can be applied with very great economy and saving of trouble for many purposes, such as cooking and various domestic operations, heating and motive power. In giving data in support of this assertion they have overstated rather than underestimated the cost, which is certainly an error on the right side, but should not, in justice to themselves, be carried to too great an extent. For example, they state that a nine-pound joint can be cooked with 25 cubic feet of gas, and that a gas stove with oven and ring burners all in full work will consume about 60 cubic feet of gas per hour; whereas, the experiments made in connection with the Crystal Palace Gas and Electrical Exhibition conclusively showed that a leg of mutton weighing 9 pounds could be cooked with a much less quantity than 20 cubic feet, the lowest figure being

13 cubic feet. The same tests also showed that, when in full service, a gas stove of the size ordinarily used only consumes about 30 cubic feet per hour, and that in many cases a good dinner could be completely prepared with a consumption of not more than 60 cubic feet of gas. Talking about the uses of gas, reminds me of a friend who has entirely abandoned the use of coal in his household, having substituted gas fires, a gas cooking stove, gas water heaters, etc. He informs me that his total consumption of gas for the winter quarter just terminated was 80,000 cubic feet, and this includes gas used for lighting. This quantity of gas, at 2s. 6d. per 1,000 cubic feet, would cost just £10; and after deducting one-third as the quantity used for lighting, would leave £6 13s. 4d. as the cost of the gas used for heating and cooking. Formerly the consumption of coal in the same household was about 7 tons during this period. The cost of coal in London ranges from £1 per ton upwards according to quality. So it is evident that any ordinary consumer, residing in the district of either the Commercial or the South Metropolitan Gas Companies would benefit pecuniarily by substituting gas for coal for all domestic purposes, to say nothing of the saving in trouble, servants' labor, wear and tear of furniture, etc.; of course, assuming that proper appliances were selected in the first place, and that the very ordinary amount of care necessary to prevent waste of gas was duly exercised. My friend has a large family, and as a necessary consequence (I am a family man myself, and write feelingly) has a large cooking stove; taking the South Metropolitan estimate, if he used his stove at full power one hour daily, he would consume 54,600 cubic feet of gas during the three months, or about as much as has proved sufficient for his total requirements in the way of heating and lighting.

Notes from the West.

By Retort.

January 25, 1886.

Said a gas man to me the other day, "A gas man's lot is not a happy one." It struck me that one is quite apt to receive such impression, if he keeps in any degree well informed as to the gas business in the West. The great attraction in this section at present is at St. Louis, Mo., where the fight is still on; and, if anything, more desperate than ever. In my last letter I remarked that the tide seemed to be changing, and that the water gas people were not having it quite so much their own way. Since that writing it has seemed (to one who is not conversant with the inside history) that the points gained up to this time are all in favor of the old company; and that, too, in the face of a most malignant prejudice. As the matter now stands the water gas bill has passed the House of Delegates—overriding the Mayor's veto—but failed to pass the Council. On the other hand, the St. Louis Company's bill has passed the Council, and (somewhat amended) has also passed the House of Delegates. The fight now seems to be on priority of passage. The St. Louis folks claim, if the water gas bill is passed first, that the latter party will then turn in and defeat their bill; while the water gas folks claim, if the St. Louis Company's measure be passed first, that, under the late decision of the United States Supreme Court, they will again have an exclusive privilege; or, at least, will be in a position to give them legal trouble. The average reader will be loth to believe than any well organized coal gas company would be so unkind as to make any trouble for a band of philanthropists (?) such as the water gas benefactors of the dear people have proved to be. This, too, would be peculiarly unkind of the St. Louis Company, when we remember that the water gas company came into St. Louis, obtained a charter under an assumed name, and, under the disguise of a "fuel company," established its plant. Then, when it was deemed safe, the mask was thrown off and they attempted to encroach upon the territories of the companies legally entitled thereto, by selling illuminating gas. Now the city representatives are being industriously impressed with the idea that it would ruin their (the water gas folks') investments, *made entirely in the interests of cheap gas*, to extend the charter of the St. Louis Company. All the water gas folks want is a bill to make and sell anywhere in the city; *then* the city may pass as many bills for other companies as the authorities may desire. But it seems "the shoe is on the wrong foot" when the city does this by passing the St. Louis Company's bill under the same conditions. Here we see at once the purely disinterested ideas that underlie the motives of the water gas manipulators. It looks now as though the city authorities would listen to the cooler judgment of some of their members, and escape the delicate trap set for them, despite its underlying stratum of "standard oil." Unless all signs fail, in a very short time the St. Louis Company will score a victory in the most bitter fight that has yet been waged between these two interests.

It is alarming to note how many gas companies throughout the West are having trouble with their city governments. It has become difficult to elect a city council that does not contain some man so devoted to the interests of the public that he poses at once as a benefactor to the extent and in the manner of attacking the local gas company. I have been surprised to learn how much there is of this; and it is proving a very serious matter to all who have vested interests in our business. While local irritation advertises most lines of trade, it invariably acts inversely toward gas interests—one blackmailer in a city council, particularly if supported by a local paper, can impress a susceptible public with his own honesty (and the utter dishonesty of the gas company) with very little trouble; and it is really surprising how, under this influence, one's own friends are so molded as to at least suspect him; while the chronic kickers and grumblers, by merely increasing their latent power, augment the flame until the gas company is ready, in self-defence, to enter into measures it neither approves nor desires.

These continued assaults will result in State legislation, or State Commissions; and may, in the long run, prove a blessing instead of, as they now appear, a curse.

Our brethren in Ohio have an excitement of their own, and thus far purely local—as far as the other Western States are concerned—the State is fast becoming a grand "carnival of flame;" and, as the end is not yet, it may be illuminated throughout most of its cities by this greatest and cheapest illuminant yet discovered—natural gas. Some enormous wells are being developed, and indications point to wonderful changes in the gas business of Ohio. Some of the brethren are made exceedingly busy by trying to "keep up with the times;" and the gas man who keeps himself, and his company's interests, next to the band-wagon is what Artemus Ward used to call "a lively little cuss."

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Prompt Action Averts Disaster.—Promptness and courage displayed by the men in charge of the retort house of the Washington Court House (Ohio) Gas Light Company prevented the wrecking of that works, by fire and possible explosion, on the morning of Jan. 7th.

Cheaper Gas for Bridgeton, N. J.—At a meeting of directors of the Bridgeton Gas Light Company, held on date of Jan. 20th, Supt. and Treas. Harding was authorized to announce that the following schedule would take effect on all gas consumption registered from 1st day of 1886:

A monthly consumption of less than 10,000 cu. ft.....	$1.80	per M.
" " between 10,000 and 15,000 cu. ft..	1.75	"
" " " 15,000 and 20,000 " ..	1.70	"
" " " 20,000 and 25,000 " ..	1.60	"
" " of over 25,000 cubic feet.....	1.50	"

The former price was $2 per thousand, the discounts allowed to consumers of largest quantities making lowest net rate equal to $1.80. This concession guarantees cheap gas illumination to the Bridgetonians, and is in queer contrast to the gas tax levied on them in 1875, when the price was $4 per 1,000. Mr. Harding, in his letter to us on the subject, aptly says, "The days of four-dollar gas are past." The annual output of the Bridgeton Company is not over eight millions cubic feet.

The Hillsboro (Ohio) Public Lighting Squabble.—Sometime ago we noted in this column that the authorities and gas company of Hillsboro were engaged in dispute as to what might be considered fair compensation for gas to public lamps and private consumers—the ten-year contract that existed between the parties having terminated with close of 1885. Council offered the company the sum of $16 per annum for each street lamp, and would agree to execute a contract for a term of years at that figure. Naturally enough the company refused to listen to such a proposition, and Council refused to increase the compensation. As a result, Hillsboro's streets were plunged in darkness, the eclipse dating from last Christmas night. The Council, when last heard from, was negotiating with the "Standard Light Company," of Cleveland, for the purchase of 100 gasoline lamps. It is action of this sort that stirs up public opinion against the managers of gas companies, and the obstinacy of the Hillsboro gas folks in failing to present a reasonably fair lighting proposition to the members of Council is, to say the least, a case parallel to that shown by the dog in the manger long ago. If the days of "four-dollar gas" are ended, it may safely be asserted that the days of $31.50 per annum (the former price paid for street lamps in Hillsboro) public lights have also "gone over to the silent majority."

Mr. Rowland Called Up Higher.—At the annual meeting of the American Society of Civil Engineers, recently held in this city, Mr. Thos. F. Rowland (proprietor of the Continental Iron Works, and whose fame as a gas engineer and constructor of gas works is world-wide) was chosen to fill the office of Vice-President during ensuing year. We hope next year to be called upon to chronicle his election to the Presidency of that sterling b dy of men.

A Deep Bore Hole.—The drills in a natural gas well that is being sunk at Homewood, Pa., are said to have already penetrated to a depth of 6,000 feet.

THE CHESAPEAKE COMPANY'S OPERATIONS AT BALTIMORE, MD.—The Benedict-Fay-Dickerson combination, otherwise known to fame and jobbery as the promoters of opposition gas companies (at various points) that receive the peculiarly inappropriate baptismal brand of "Equitable," were obliged to procure a new stencil plate wherewith to mark their opposition establishment at Baltimore, and so selected the title, "Chesapeake." The "Chesapeake" being ready to supply gas to the residents of the Monumental City, the gas men got themselves in readiness for the fray, the first attack being made by the Consolidated, who reduced their selling rates to $1 per thousand. This move was met by the "benefactors," who, on date of Jan. 20, promptly told the consumers that gas would be furnished them for 50 cents per thousand—until further notice! Our Baltimore advices bear date of Jan. 21st, and while we cannot authoritatively state that the old companies met this last reduction in rates, we are of the opinion that such is the case. In the meantime a bill is pending in the Maryland Legislature which seeks to forbid the consolidation of opposition gas companies, as also to forbid the charging of over $1.25 per thousand cubic feet for gas supplied. We understand that those in charge of the "executive department" of the Equitable's opposition staff are endeavoring to procure subscriptions to the stock of the proposed "branch" at Newark, N. J., for which city they claim to have a franchise granting them the right to build and operate a works therein. We do not suppose the invitations extended to unwary investors are accompanied with a copy of the agreement entered into between the city and the Newark and Citizens Gas Light Companies, during the summer of 1884 (for which see JOURNAL, issue of Aug. 16, '84, pp. 85–86), but we would suggest to the "gentlemen" who are at the back of this Newark scheme that they cannot hope to keep that information entirely to themselves. We might further convey to them (if investors are not informed of the existing compact at the time they are requested or invited to place their names on the subscription books), in the most delicate manner possible, that such failure may cause some people—especially those who are satisfied to do business in the honest old-fashioned way—to think their Newark scheme savors somewhat of false pretences. We fear that their proposed Newark branch, however, is quite likely to come to grief.

A LARGE DIE STOCK.—A Bridgeport (Conn.) firm of manufacturers have recently finished one of the largest die stocks on record. It is intended to cut and thread eight-inch pipe, and can be operated by one man. It was shipped to Russia.

MESSRS. HELME & MCILHENNY IN THEIR NEW BUILDINGS.—Messrs. Helme & McIlhenny, the well-known firm of meter makers, whose former place of business was at Nos. 1115 and 1117 Cherry street, Phila., Pa., have removed to their new buildings, running from 1339 to 1349 Cherry street. The new shops are fitted up with every modern appliance necessary to the speedy and proper construction of station and consumers' meters, etc. It is needless for us to dilate upon their standing in the gas world; the records of their work speak for them. Let us hope that their commerce in the new buildings will be in proportion to that enjoyed by them at the old stand.

GROWTH OF THE GAS INDUSTRY IN KANSAS.—The gas industry of Kansas has made great progress during the past three years, and the outlook for a future increase is brighter than ever. In 1883–4 works were erected at Parsons, Wichita, Wyandotte, and Winfield. Jones, Tiernan & Jones are now erecting a plant in Eldorado, Butler county. Eldorado has a population of about 5,500. The St. Louis Interstate Building Company is putting up a works in Hutchison (population 6,000), Reno county. Mr. Chas. W. Hill, of Parsons, is now under contract to build a works at Wellington (population 6,000), Sumner county; he expects to begin right away. Minneapolis (population about 5,500), Ottawa county, will undoubtedly contain a gas plant before end of current year. Eureka Springs, Arkansas, will also have a works; the contracts for same have been given out.

GAS ENGINES TESTS AT RECENT FAIR OF AMERICAN INSTITUTE.—At the 45th Fair of the American Institute the judges appointed to make a test, with regard to certain points developed in the working of the Otto and Clerk gas engines, reported that, "under the existing conditions, the results as regards consumption of gas were practically identical—the difference being only one-fifth of a cubic foot per horse power per hour." The judges also recommended "a more thorough and longer test" be made, "which will bring out the difference in economy, if any, or prove beyond question the equal standing of the two engines on that score; in which latter case it would become proper to base a decision on other points."

CHEAPER GAS FOR GALESBURG, ILLS.—Mr. J. K. Mitchell, Secretary of the Galesburg Gas Light Company, has notified the people of that city of the intention of the directors to make the following schedule of rates, the same to take effect on quantities consumed from and after the first day of next July:

A monthly consumption of less than 1,000 cu. ft.....	$2.20 per M.	
" " between 1,000 and 10,000 cu. ft.	2.00	"
" " over 10,000 cu. ft.....	1.80	"

The old rate will apply in case accounts are not settled on or before 15th day of month.

CHEAPER GAS FOR BUCYRUS, OHIO.—On the first of year the owners of the Bucyrus Gas Light and Fuel Company reduced selling rates by the sum of 50 cents per thousand. This makes a new net rate there of $2.50.

ELECTED SECRETARY.—Bro. "Gus." Littleton, besides his connection with the Quincy (Ills.) Company as Superintendent, has been elected to preside in the chair at the Secretary's desk of that corporation. We congratulate the Company in its choice, and "Gus." on the promotion. It is a pretty big chair that he cannot ably fill.

CEMENT FOR PATCHING RETORTS.—Messrs. Evens & Howard, the well-known fireclay goods manufacturers, of St, Louis, Mo., are disposing of great quantities of their fireclay cement. Those who have used it say that it is an excellent material.

PUTTING IN A WEBER FURNACE.—The North Adams (Mass.) Gas Light Company will build a one-half depth Weber regenerative furnace in its retort house.

ANNUAL ELECTION, WILLIAMSPORT (PA.) GAS COMPANY.—The annual meeting of stockholders in Williamsport Gas Light Company to chose a board of directors for 1886 was held on date of Jan. 13th. The result is appended: Directors—Messrs. B. B. Bowman, J. G. Reading, R. P. Allen, J. B. Coryell, J. M. Gazzam, H. Mudge, and J. G. Reading, jr. Organization was next effected in the selection of J. M. Gazzam as President; Sec. Treas. and Supt., C. A. Byers; Solicitor, J. G. Reading, Jr.; Collector, J. Calvert.

ELECTION OF TRUSTEES FOR CONSOLIDATED (N. Y. CITY) GAS LIGHT COMPANY.—On Jan. 25th the stockholders in Consolidated Gas Company (this city) selected the following gentlemen as a board of trustees to manage affairs during 1886: Messrs. Chas. Roome, Thos. K. Lees, Oscar Zollikoffer, Jas. W. Smith, Chas. G. Francklyn, Thos. Rutter, Har. E. Gawtry, Percy R. Pyne, Sam. Sloane, Henry Day, Jno. P. Huggins, Elias S. Higgins, and Henry Clausen.

GAS MATTERS AT ROCKFORD, ILLS.—The interests of the company so long controlled by the once able head and hand of honest "Tom." Butterworth, of Rockford, are not likely to diminish in value, as the reins of power have descended to W. C. Butterworth, who has proved himself worthy of the trust that devolved upon him with the decease of his father. The former President of the Rockford Company was one of the pioneers in the matter of low selling rates, and we are gratified to note that the old-time policy will be adhered to under the new *regime*. A notice recently forwarded by the company conveys the intimation that the schedule prices now ruling there are the following—the discounts being made from a gross rate of $2 per M.:

A monthly consumption of over	500 cu. ft.....	$1.90 per M.			
"	"	"	5,000	"	1.80 "
"	"	"	20,000	"	1.70 "
"	"	"	35,000	"	1.60 "
"	"	"	50,000	"	1.50 "

Last fall we noted in our "item" columns that an electric lighting company was anxious to perform the public lighting of Rockford, and we can now supplement that statement with the following particulars. For our knowledge of same we are indebted to the courtesy of Mr. W. C. Butterworth. It appears that the contract between city and gas company, in the matter of lighting public lamps, expired on Jan. 1, 1885. The compensation named in contract involved the payment of $27.60 for each lamp maintained; and there was also a separate agreement with the city which called for the payment of a certain fixed rental, for each post and lantern, by the city to the company (the company owns the lamps), until the city acquired the equipment by purchase. This payment was to be made whether the lamps were lighted or not, and the contract was to remain in force (as to rental payments) until the city made the purchase. In the summer of '84 the late Mr. Butterworth submitted a proposition to City Council, whereby he sought to make a new contract, and at a less price as compared with the then existing regulations. The new proposition embraced ten distinct proposals, covering one to ten years, the reduction in price being governed by, and in proportion to, the number of years for which the city would contract. The proposal was considered by Committee on Light, and it recommended that the five-year agreement be accepted. When the Council was discussing the report of committee the local electrical promoters put in an appearance and asked for delay, urging that they would soon be in condition to enter as a competitor. The whole matter was accordingly tabled. The

following spring the committee on light was instructed to advertise for bids on public lighting. In due time it was found that bids had been submitted by the gas and electric interests; and it was also determined that the proposition of the former would be most advantageous to the city in the matter of economy, and of efficiency as well. The committee recommended an acceptance of the gas company's bid; but here arose a decided stumbling block. An increase in number of lights had been provided for, and when the total cost of contract was footed up, the figures failed to come within the appropriation that had been set apart—the appropriation had been cut down from total of previous year. The committee was then instructed to get a figure from gas company for lighting the old (331) number of lamps, and so discarded the proposed addition to the lighting service. While engaged on that work the committeemen were approached by the electricians, and were informed the incandescent—it should have been previously said that original electrical estimates were based on the arc system—plan would now be tried. It thus came about that when the gas company was ready with its figures on the 331 lamp scale, the electricians were in the field with an incandescent estimate. As before, gas was the cheaper—in fact, the electrical bid just figured out equal to what the previous bid of the gas company had been. The committee once more reported in favor of gas; but on the night when Council was to pass a final verdict the electricians withdrew their bid, and claimed that, owing to "new discoveries," they would be able to do better by the city—in passing, attention might be called to the fact that, at this time the President, Secretary, and one stockholder in the electrical corporation were members of the Council! The committee was now instructed to receive propositions for supplying the lamps with a 16-candle light; and this brings the record up to the present time. The Rockford Gas Company has its figures ready to hand to the Council, but the electricians seem to be awaiting further "new discoveries." It might be said that during the controversy the gas company has been lighting the lamps on the $27.60 per annum basis. The Rockford Electric Light Company started in to supply incandescent illumination on Jan. 1st, and may have about 600 lamps in the city—all of which are "on probation." The Supt. of the electric station stated "confidentially" that these rated 16-candle power lamps were really affording about 10 candles. In stores where the electric lamps displaced gas burners ten of the former take the place of six of the latter. The electric lamps are charged for at the rate of one cent per hour each. To show how the electric system has affected the business of the Rockford gas company we give the following figures as taken from the company's books: Output first 15 days of Jan., 1884, 1,001,000 cu. ft.; same period, 1885, 1,190,000 cu. ft.—a gain of 189,000 cu. ft.; first 15 days of Jan., 1886, 1,407,000 cu. ft.—a gain over '85 of 217,000, which shows the matter up in clearest sort of style. The Rockford company will build new purifiers ($12 \times 12 \times 3$) this season, and also rebuild one-half of retort house and settings—the other half was rebuilt last year. A new station meter will be added, and these improvements will place the plant in perfect condition.

Utica (N. Y.) Electric Street Lighting to be Continued.—It was supposed that termination of '85 would also terminate the electric street lighting of Utica; but it seems not. [Of course, we suppose it is understood by our readers that Mr. H. H. Fish, the chief executive officer of the Utica Gas Light Company, controls and operates the local electric lighting plant there.] The City Council met in special session, on date of December 31st, and authorized and ordered that a contract be entered into with Mr. Fish for the supply and maintenance of 50 arc lights at a price not to exceed 53½ cents per light per night. With Mr. Fish's well-known capacity for making careful, critical analyses of matters with which he is connected, we may reasonably hope that that gentleman will furnish the fraternity, at some future period, with a batch of most interesting figures concerning the prime cost, etc., of electricity as an agent in street lighting.

Gas Matters at Phillipsburg, N. J.—Mr. Sam'l Trumbore, Supt. of the Phillipsburg Gas Company, writes us that his company is now in full possession of the matter of supplying the consumers of that town with gas. The company started out in 1877, and was formed in consequence of loud complaint from the residents at the poor supply previously maintained by the Easton (Pa.) Company, located on the west side of the Delaware river. In 1877 the Easton company was charging $2.75 per thousand for gas sold in Phillipsburg, and had about 160 consumers there. The new company, when ready for work, put the price at $2.25; and 18 months thereafter reduced the net figure to $2. The latest schedule (made not long since) entitles all those whose monthly bills reach to a value of $1 to receive their gas at a net rate of $1.90 per 1,000. The Phillipsburg company's annual output in 1885 was only 3½ millions cubic feet; but still the stockholders received 8 per cent. on their investment—and have received a similar dividend since 1882. The illuminant supplied is a mixture of coal and oil gas, and the quality of resultant product will average 19 candles. The Easton company ceased all attempt at competition some 6 months ago; but at the time of "shutting off" it only had 18 consumers in Phillipsburg. With the exception of Easton proper, the gas companies in the neighborhood of Brother Trumbore's works are receiving a higher figure than $1.90. Mr. T. has been connected with the gas industry for many years, and is a painstaking, shrewd and successful manager.

In Regard to Troy (N. Y.) Public Lighting.—We have received some valuable figures regarding the probable excess of cost of electricity over gas in the matter of lighting the lamps on Troy's streets; but will not publish same until we have further advices from that city.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

The Siemens-Lungren and Albo-Carbon Burner Tests.

Office of Siemens-Lungren Co.,
Twenty-First and Washington Avenue,
Philadelphia, Pa., Jan. 23, 1886.

To the Editor American Gas Light Journal:

I observe that your issue for January 16th contains a communication from Mr. A. Kitson, a member of the Philadelphia firm which controls the fortunes of the Albo-Carbon Light Company, in this vicinity, who refers therein to the reports of the tests on burners exhibited at the "Novelties" display. The writer appears to be greatly perturbed over the fact that while the Franklin Institute Committee awarded a silver medal to the Siemens-Lungren Company, the same examining board adjudged the Albo-Carbon Company's burners as only worthy of a bronze medal. Mr. Kitson insinuates that gross unfairness has been shown by the Committee, etc.; in view of which innuendo I would ask if the gentleman has worked himself up to such a "state of mind" because the Siemens burner developed 9.04 candle power per foot of gas, while the albo-carbon light yielded but 8.33 candles per foot?—and that such illuminating value was only secured through the aid (by absorption) of 2.88 pounds of "albo-carbon" enriching material to every 1,000 feet of ordinary coal gas used. I will take for granted that the albo-carbon material costs but ten cents per pound. If the Siemens showing will not account for Mr. Kitson's perturbation, must I then attribute it to the fact that the Lungren burner developed 9.12 candles per cubic foot of gas in the horizontal, 13.9 candle power per foot at an angle of 45°, and 13.99 candle power per foot in the vertical measurement, while the albo-carbon light afforded but 8.33 candle power per foot, after the expense incurred for enriching material in quantity, and at price, as before stated.

To develop 8.33 candle power per foot of gas consumed, under the albo-carbon process, it is necessary to increase the original cost of the gas by about 30 cents per 1,000 cubic feet; but the Siemens or Lungren burners will develop the higher candle power *without* any augmentation in cost of the gas used. Mr. Kitson further states that the cold was intense, which may in some manner account for his dissatisfaction; but, at any rate, it was *a decidedly cold day* for the albo-carbon light. Respectfully,

E. Stein, Pres.

One of the Test Judges Replies to Mr. Kitson.

Philadelphia, Pa., Jan. 25, 1886.

To the Editor American Gas Light Journal:

The grievance of Mr. Kitson, as stated in his communication to you, is purely imaginary.

Speaking for myself, and as one of the judges having charge of the tests of gas lamps at the "Novelties" Exhibition, it was not possible for the committee to make the tests during warm weather; and we could not prevent the "blowing of the wind." What we could and did do was to make our tests over, because we had doubts as to their correctness. In the meantime we had the open stairway, through which most of the wind came, closed up, and a stove was put in to warm the room sufficiently. The curtain in front of our photometer was also fixed so that it could not be moved by the wind.

The first series of tests of the albo-carbon lamp was made on Oct. 30th; and the second (and final) series was made on Nov. 2d. None of the results of our work on October 30th were used in our report in any way; and the tests of November 2d we believe to be entirely accurate. Our meter was a Sugg decimal meter, of extreme accuracy, loaned us by a leading expert of this city, who had used it in his expert work. A spot of rust had perforated the inlet close to the coupling nozzle outside of the meter shell and caused a leak; but as this was stopped at once, and as the meter was in perfect condition otherwise, and this leak could not disturb its readings in the slightest degree, we continued to use it during our tests.

For measuring the gas consumed by the larger lamps we had a new decimal meter furnished by the American Meter Company. No carelessness or inaccuracy of any kind was allowed to enter our tests; and in making such a charge Mr. Kitson seems to forget that the tests were watched closely, and there were a number of eye-witnesses, who were quite as competent as himself, to judge both of method and results. Besides, if he was not satisfied with the tests he should have objected at the time instead of waiting until our work was done and the apparatus removed.

No official publication of our report has been made. And while the figures are correct, the explanatory part of our report upon each lamp should accompany the figures, as our awards were not based, as Mr. Kitson seems to think, upon the candle power tests alone. I am respectfully yours,

Moses G. Wilder.

The Market for Gas Securities.

The city gas share market has exhibited the usual erratic features, although the range of prices has been fairly well maintained. Consolidated gas has shown the least variation; and, as predicted in our last, the undertone to speculation in this security developed increased strength with succeeding quotations. On Saturday (Jan. 30) first sales were made at 102. The election of directors, and subsequent organization meeting of directors, passed off harmoniously. Gen. Roome, who declined a re-election to the President's chair, is succeeded by Mr. Jas. W. Smith, and the name of the new incumbent is a sufficient guarantee that the usual sound style of financial policy will prevail. In other words, stockholders in the corporation are guaranteed that conservatism and common sense will, as heretofore, continue to rule in the management of the company's affairs. We note that Equitable gas shows an important decline. It is high enough (138 to 140) in all conscience. Mutual is steady to strong. Brooklyn shares (except Nassau) are weaker. San Francisco (Cal.) Company's annual report shows an improving condition of affairs. During the year 1885 a floating debt of $95,000 has been paid off, and stockholders received dividends aggregating $150,000. It is more than probable that 1886 will see this return increased by at least one-quarter million dollars. The figures in annual report furnish eloquent evidence in regard to the matter of President Crockett's ability as a business manager.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks.

16 Wall St., New York City.

February 2.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	102	—
Central	440,000	50	60	70
" Scrip	220,000	—	47	57
Equitable	2,000,000	100	138	140x
" New Stock			123	125
" Bonds	1,000,000	—	107	110
Harlem, Bonds	170,000	—	—	—
Metropolitan, Bonds	658,000	—	113	—
Mutual	3,500,000	100	137	138x
" Bonds	1,500,000	1000	104	107
Municipal, Bonds	750,000		—	—
Northern	125,000	50	50	—
" Scrip	108,000			

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135 Sycamore St., Cincinnati, Ohio.
53 to 55 German St., Baltimore, Md.
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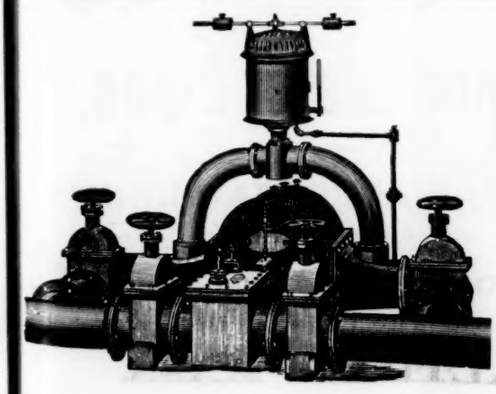

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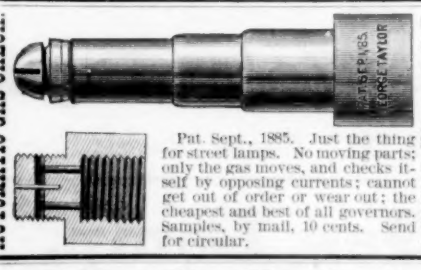

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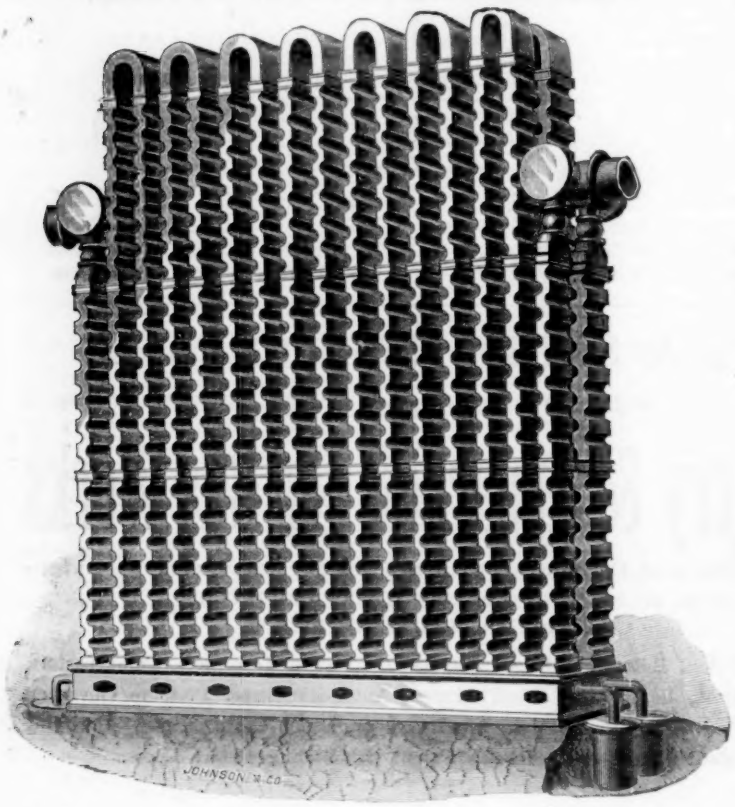

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